The α and β radiations have the power of developing phosphorescence in certain bodies, notably zinc sulphide, the platinocyanides, and the diamond. All strongly radioactive substances emit light themselves and are phosphorescent in the dark room.

Alterations in colour occur in glass and certain precious stones; for instance, the diamond and the ruby, when exposed to radium. These phenomena are seen also in an X-ray tube, and are believed to be due to the β or kathode rays.

Chemical changes produced by radium are of great interest, and here, we believe, there will be found on further investigation a remarkable field for work. Oxygen is changed into ozone. Water is converted into peroxide of hydrogen. The radium emanation has also the power of re-combining hydrogen and oxygen to form water. It is believed that the α rays are the agents of these changes. The β rays convert yellow phosphorus into the red variety, and liberate iodine from some of its compounds.

The chloride, bromide, sulphate and carbonate of radium are known, but the metal itself has not yet been isolated. The element is believed to be dibasic, and resembles barium in its compounds. The atomic weight is about 226·7 (Thorpe). In 1900, Dorn discovered that radium constantly gives off an emanation. This emanation is a gas, and it can be pumped off. The emanation produces heat. One grain of radium is believed to emit about 80 gram-calorics in an hour (Precht). As radium is constantly giving off emanation it is undergoing decay, and there is reason to believe that this decay is exceedingly slow. A number of investigations have been made to determine its "life." The "life" of the emanation is less than four days. That of radium probably as long as 1750 years.

The spectrum of radium emanation has been investigated by several workers, and Ramsay and Soddy have observed its change into helium, but it is not yet certain whether other bodies are not produced.

One great problem which lies before the physicist in his work with radium and kindred bodies is the possible transformation of elements. It is believed that the gradual change of radium is in the direction of lead. The production of helium was detected by spectroscopic examination, and so far the work has chiefly rested on this form of observation, but there appear to be chemical evidences also. Several fascinating theories have been put forward to explain the evolution and devolution of elements, but at the present time all that can be done is the accumulation of facts.

Turning now to the medical aspects of radium, and naturally these appeal most to the general public, it may be stated that its field in therapeutics has been studied for some years, and its limitations are fairly evident. Radium kept in contact with the skin, or separated from it by clothing, has produced intractable burns, similar to those induced by excessive exposure to the X-rays. Cases of nævus, port-wine stains, and moles, both of the pigmented and hairy varieties, have been removed by it. Warts also rapidly disappear. So far the effects have been seen in superficial conditions. Rodent ulcer, a superficial form of skin cancer, has been cured by radium, just as it has by the X-rays, but there have been cases in which, by its greater penetrative power, no doubt, radium has succeeded where the X-rays have failed. The cure of rodent ulcer by radium has been proved to be lasting by a case shown recently at the Royal Society of Medicine, the cure having lasted for five years. What everyone wants to know is whether in radium we have the long-sought cancer cure. It is by no means likely, but it is not impossible. It is true that mouse-cancer can be removed by it, but cancer induced in mice is a very different thing from human cancer. Sir Frederick Treves points out that the power of radium to effect its cures is immensely increased by using a quantity. The Radium Institute, it is hoped, will be in possession of such a quantity that it will be able to give an answer to this all-important question of cancer cure. Above all things, it is important that the public should know that so far clinical work has been negative in cancer proper.

It might have been supposed from the articles which have appeared in the daily Press that very little work had been done in this country with radium as a curative agent, but that is not the case, considering the small quantity of the salts which have been available. Radium is best applied on a flat surface, and the difficulty has been to spread the substance evenly and coat it with a varnish that can be sterilised by heat or otherwise. The importance of this will be realised when the radium has to be placed in contact, or at any rate very close, to diseased surfaces. This difficulty has been overcome by Ganne.

All the early work with radium has been done with material obtained from pitchblende derived from Joachimsthal, in Bohemia. According to Strutt it is present in small quantities in several places, and that most likely to be now worked is in Cornwall, where there is pitchblende containing 48·5 millionths per cent. of radium, and also a cupro-uranite, which has no less than 120 millionths per cent.

THROUGH THE HEART OF LABRADOR.

IN 1903 Leonidas Hubbard, jun., a young American journalist, conceived the idea of exploring Central Labrador and passing through the country by means of the water-way from Hamilton inlet to the shores of the Arctic Ocean at Vugara. Only one white man, the gallant Père Lacasse, has accomplished this journey if we except the wonderful pilgrimage of John McLean, who travelled up to the Arctic through Labrador and back to the St. Lawrence by a slightly different route. We know how poor Hubbard missed his way and travelled by a somewhat circuitous route to within sight of Lake Michikamats, and then, after being forced to retreat before the oncoming winter, perished miserably from starvation on the banks of the Susan River within a short distance of food and help. The hero of that journey and subsequent events was George Elson, who, with a Cree Indian, a Russian half-breed, and a young Eskimo, accompanied Mr. Hubbard's wife in the attempt to carry out the journey and the mapping of certain geographical features which the unfortunate explorer had failed to do. That the effort was successful is evinced in the interesting volume, "A Woman's Way through Unknown Labrador."

With such skilled helpers it is plain that Mrs. Hubbard was a mere passenger on the trip, for she had to undergo no hardships worse than the bites of insects; but that she is a woman of no small courage is seen in a hundred ways, for it takes nerve of the 3-o'clock-in-the-morning variety, as the writer can testify, to shoot boiling rapids in a light 19-feet canoe, and the pluck she showed in pushing on, after reaching the height of the land at Lake Michikamats, where doubts as to the chance of reaching Vugara or even Davis inlet before the autumn freeze-up were freely expressed, was of no mean order. Then, too, the chance of missing the one annual steamer, with

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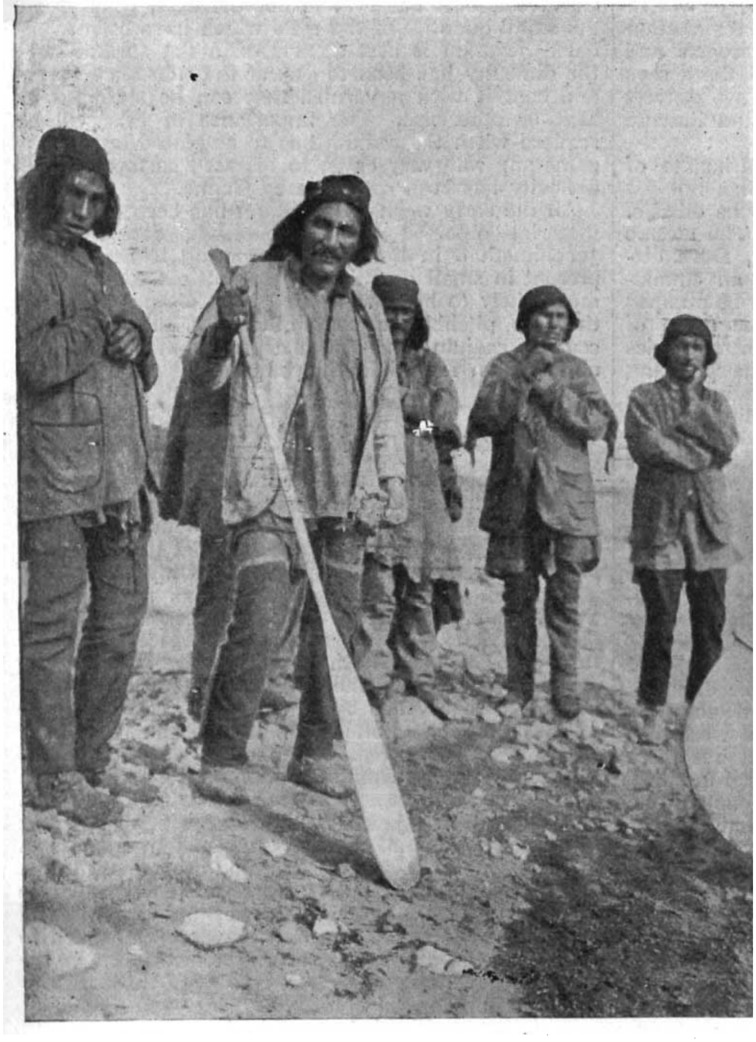
[1] "A Woman's Way through Unknown Labrador. An Account of the Exploration of the Nascaupee and George Rivers." By Mrs. L. Hubbard, Jun. Pp. xvi+338. (London: John Murray, 1908.) Price 10*s.* 6*d.* net.

the prospect of a year of monotony and cold, did not deter this courageous lady, nurtured in the lap of cities.

The record of the journey as far as Lake Michikamats is somewhat tedious and not of much interest to experienced travellers. Too much is made of trivial incidents, and the humour of the writer is not of a high order. Only once is she allowed to wander a little way from camp, and the result is one of the poorest jokes on record. Chapter viii. is entitled "Scaring the Guides," and twelve pages are devoted to the *fun* of throwing her four excellent helpers into a state of fear, to say nothing of the loss of many cartridges, of which, by her own account, they had only a small stock, just to see how great a commotion would be made by her supposed loss. This might be amusing in the Thames Valley or on the St. Lawrence River, but it does not seem quite the right thing in Central Labrador.



The Nascaupee Chief and Men. From "Through Unknown Labrador."

Mrs. Hubbard's account of her first meeting with the trekking herds of Barrenland caribou is full of interest, and she was indeed fortunate to have witnessed a sight that some white hunters would give much to see. The author expresses the view that the deer are being decimated, and that in a few years only a remnant of the vast numbers will be left. With this view we do not agree. They may be killed off locally, and even desert some area for a number of years, a circumstance which gives rise to such statements; but the main body, in spite of ruthless slaughter at certain points and seasons, will live on. Every year at least 8000 to 10,000 caribou are killed in Newfoundland out of a rough total of 200,000, and yet those deer are on the increase, and every year numbers of tales are published that the deer are being exterminated. These come from districts which the erratic caribou have left temporarily, and to which they may return.

There is a delightfully feminine touch in Mrs. Hubbard's description of her first meeting with the deer and their alarming appearance:—

> "When they saw us, the stags lined themselves up in the front rank and stood facing us with heads high in a defiant air. It was a magnificent sight. They were in summer garb of pretty brown, shading to light grey and white on the under-parts. The horns were in velvet, and those of the stags seemed as if they must surely weigh down the heads on which they rested. . . .
>
> "I started towards the herd, kodak in hand, accompanied by George, while the others remained at the shore. The splendid creatures seemed to grow taller as we approached, and when we were within 250 yards of them their defiance took definite form and, with determined steps, they came towards us.
>
> "The sight of that advancing army under such leadership was decidedly impressive, recalling vivid mental pictures made by tales of the stampeding wild cattle in the West. It made me feel like getting back to the canoe, and that is what we did. We and the caribou stood watching each other for some time. Then the caribou began to run from either extremes of the herd, some round the south end of the hill, others away to the north, the battle line of stags still maintaining their position.
>
> "After watching them for some time, we again entered the canoes. A short paddle carried us around the point beyond which the lake bent to the north-west. There we saw them swimming across the lake. Three-quarters of a mile out was an island, a barren ridge standing out of the water, and as they swam they formed a broad, unbroken bridge, from mainland to island, from the farther end of which they poured in steady stream over the hill top. . . . The country was literally alive with the beautiful creatures."

The account, brief as it is, of the meeting with the Montaignais and Nascaupees is full of interest, and Mrs. Hubbard used her eyes and ears to some purpose in her short study of these wild people. It is a pity that there are not more ethnological notes of this kind in the book, for what we want to know of Labrador is not the common incidents of travel, experiences such as every schoolboy puts in his first book, but first-hand observations of its botany, mineralogy, zoology, and ways of the wild races. But if Mrs. Hubbard does not give us a very satisfactory or scientific study of Labrador, she leaves us with the impression of a charming and plucky little woman, whose devotion to her husband and his dreams is pure and true. All men approve of that kind of woman, and wish her and her book every success. Mention must be made of an excellent introduction by Mr. William Cabot, which summarises the work of previous travellers in Labrador; also of a good map by Mrs. Hubbard at the end of the volume, which will be of great service to future travellers.

J. G. MILLAIS.

A TROPIC ISLE.[1]

"IF a man does not keep pace with his companions, perhaps it is because he hears a different drummer. Let him step to the music which he hears." Our beachcomber is a squatter in search of the "simple life." He takes up a little island off the coast of Queensland, determined to make it his home and himself master of all the lore that is thereon. Dunk Island, as it is called, is situated about lat. 18° S., and, being really a part of Australia, with high hills and fringing reefs of coral, presents a picture which may well serve in miniature for any tropic isle of continental origin. The rainfall is abundant, and the jungle is a well-described medley of trees, ferns, and lianes, chief of them the climbing palm.

A little of the ground is cleared, the homestead is erected, the praises of the papaw and banana are sung. The beachcomber has enough and contends no more. Birds delight him and guns are taboo. However, civilisation will out, and a census is taken, social as well as numerical. The sagacious megapode hatches its enormous egg (12 per cent. of its own weight) in its own dung heaps. The swamp pheasant plays "hawk" to the fowls. The bee-eater and wood swallow make bee-keeping impossible. The eagle is a detective, deadly foe to snakes of land and sea. The nutmeg pigeon brings news twice a year from the outside world, and other pigeons perennially express their doleful remonstrances at the poor crops of figs on the banyan trees. Lastly, the sea birds have returned, and the owner has been driven off his own paths, annexed for their breeding fairs. There is, too, the Echidna, dainty morsel for the aged blacks, and the story of the snake and the nest eggs is charming. Of insects we desire to hear more.

In one bay is a garden of coral, killed off by brown mud after a storm, but sprouting afresh from out the slimy mass. It is pictured as a July garden—the island is situated within the Great Barrier Reef—but yet the most cruel battlefield of nature. Corals grow over and smother all they can. Molluscs are murderers and cannibals. "No creature at all conspicuous is safe, unless it is agile and alert, or of horrific aspect, or endowed with giant's strength, or is encased in armour." The clam sits on the coral, and becomes embedded as it grows up around. Serpula is more successful, raising its anemone-like head well above the surface of the coral in a tube of lime. Fish are like gigantic butterflies hovering over flowers. Bivalves tunnel the coral, and sea-urchins grind to powder its limestone ramparts, gnawing off the crumbs of coral which fill up the greater part of their digestive organs. The *bêche-de-mer* is there too, and oysters of many kinds. Then there is the dugong in herds, frolicking in the water, human in its affection for its young. It is a seaweed feeder; it does no harm—but it makes good bacon. Is the love for all nature, so markedly professed, consistent with its destruction? The descrip-

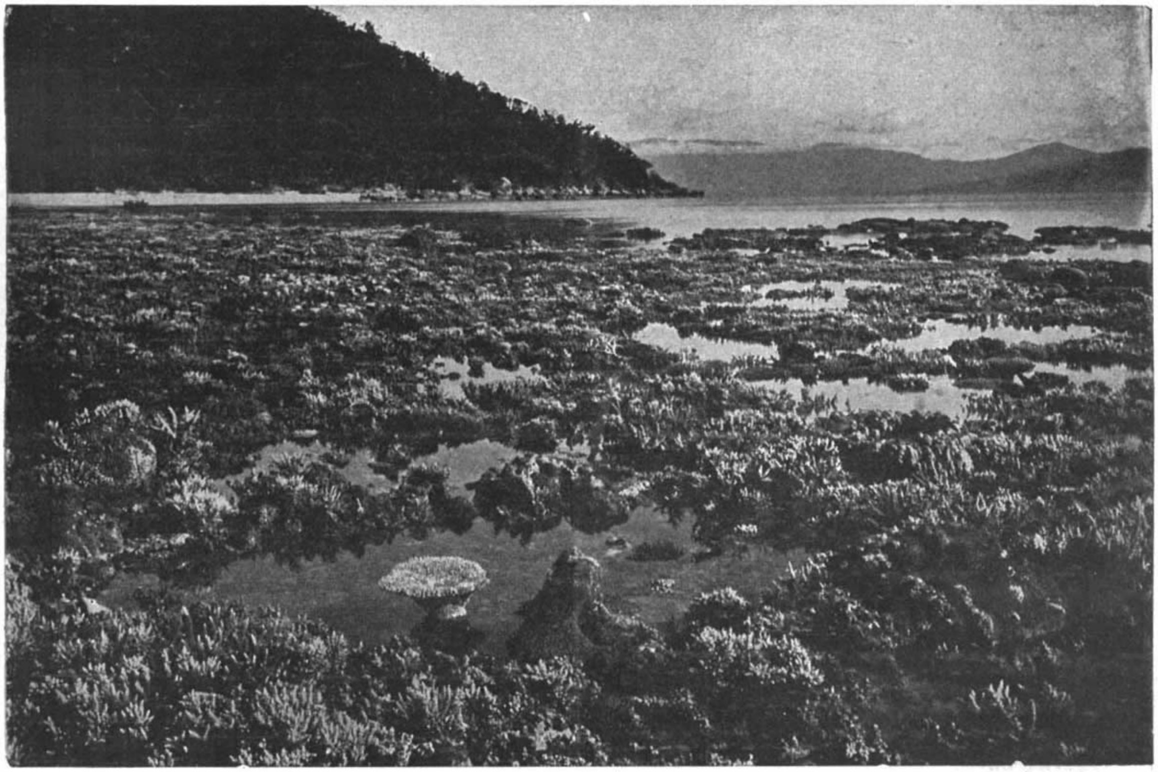


FIG. 1.—A Protected Coral Garden. From "The Confessions of a Beachcomber."

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[1] "The Confessions of a Beachcomber." By E. J. Banfield. Pp. xii+336. (London: T. Fisher Unwin, 1908.) Price 15*s*. net.